EVOLUTION

INTERNATIONAL JOURNAL OF ORGANIC EVOLUTION

Volume XXVI, 1972

HARLAN LEWIS
Editor

PHILIP W. HEDRICK
Managing Editor

Published Quarterly
At Allen Press, Inc., Lawrence, Kansas 66044
By the
Society for the Study of Evolution

CONTENTS TO VOLUME 26

ABDEL-HAMEED, FATHI AND RICHARD SNOW. The Origin of the Allotetraploid *Clarkia gracilis*. 74

ALCOCK, JOHN. The Evolution of the Use of Tools by Feeding Animals. 464

ANDERSON, LORAN C. *Flaveria campestris* (Asteraceae): A Case of Polyhaploidy or Relic Ancestral Diploidy? 671

ANSSI, SAURA. (See Lakovaara, Seppo.) 177

AVISE, JOHN C. AND ROBERT K. SELANDER. Evolutionary Genetics of Cave-Dwelling Fishes of the Genus *Astyanax*. 1

BAND, H. T. Further Evidence of Genetic and Increased Developmental Homeostasis in a *Drosophila melanogaster* Natural Population during a Minor Climatic Shift. 116

BARDACK, DAVID. Vertebrate Paleozoology. (review) 487

BARGHUSEN, HERBERT R. (See DeMar, Robert.) 662

BARLOW, GEORGE W. A Paternal Role for Bulls of the Galapagos Islands Sea Lion. 307

BECK, BENJAMIN B. Primate Societies: Group Techniques of Ecological Adaptation. (review) 484

BERUBE, DENIS E. (See Levin, Donald A.) 242

BRYANT, EDWIN H. AND CARL R. TURNER. Rapid Evolution of Competitive Ability in Larval Mixtures of the Housefly. 161

BUTLER, P. M. Some Functional Aspects of Molar Evolution. 474

CIMINO, MICHAEL C. Egg-Production, Polyploidization and Evolution in a Diploid All-Female Fish of the Genus *Poeciliopsis*. 294

COOK, SHEILA C. A., CLAUDE LEFÉBVRE, AND THOMAS MCNEILLY. Competition between Metal Tolerant and Normal Plant Populations on Normal Soil. 366

CROVELLO, THEODORE J. AND CARL S. HACKER. Evolutionary Strategies in Life Table Characteristics among Feral and Urban Strains of *Aedes aegypti* (L.). 185

CRUDEN, ROBERT WILLIAM. Pollination Biology of *Nemophila menziesii* (Hydrophyllaceae) with Comments on the Evolution of Oligolectic Bees. 373

DA SILVEIRA, ZULEICE VIANA. (See Kerr, Warwick Estevam.) 197

DAVIES, M. S. (See Snaydon, R. W.) 390

DAWSON, PETER S. Evolution in Mixed Populations of *Tribolium*. 357

DEMAR, ROBERT. Evolutionary Implications of *Zahnreihen*. 435

DEMAR, ROBERT AND HERBERT R. BARGHUSEN. Mechanics and the Evolution of the Synapsid Jaw. 622

DOBZHANSKY, THEODOSIUS. (See Powell, Jeffrey R.) 553

DODSON, CALAWAY H. (See Williams, Norris H.) 84

DRUGER, MARVIN AND RICHARD P. NICKERSON. Maintenance of Chromosomal Polymorphism in a Population of *Drosophila pseudoobscura*: Viability under Crowded and Uncrowded Conditions. 322

DUGLE, JANET R. (See El-Lakany, M. H.) 427

EL-LAKANY, M. H. AND JANET R. DUGLE. DNA Content in Relation to Phylogeny of Selected Boreal Forest Plants. 427

EMMEL, THOMAS C. Mate Selection and Balanced Polymorphism in the Tropical Nymphalid Butterfly, *Anartia fatima*. 96

FALK, CATHERINE T. (See Lakovaara, Seppo.) 177

FRYER, JOHN H. (See Ledig, F. Thomas.) 259

FUJII, KOICHI. (See Sokal, Robert R.) 489

GILBERTSON, L. G. (See Hagen, D. W.) 32

GILL, FRANK B. AND BERTRAM G. MURRAY, JR. Discrimination Behavior and Hybridization of the Blue-Winged and Golden-Winged Warblers. 282

GOOCH, JAMES L. AND THOMAS J. M. SCHOPF. Genetic Variability in the Deep Sea: Relation to Environmental Variability. 545

GRANT, MICHAEL C. AND VERNON W. PROCTOR. *Chara vulgaris* and *C. contraria*: Patterns of Reproductive Isolation for Two Cosmopolitan Species Complexes. 267

GREAVES, WALTER STALKER. Evolution of the Merycoidodont Masticatory Apparatus (Mammalia, Artiodactyla). 659

GREENSLADE, P. J. M. Distribution Patterns of *Priochirus* Species (Coleoptera: Staphylinidae) in the Solomon Islands. 130

GREENSLADE, P. J. M. Evolution in the Staphylinid Genus *Priochirus* (Coleoptera). 203

HACKER, CARL S. (See Crovello, Theodore J.) 185

HAGEN, D. W. AND L. G. GILBERTSON. Geographic Variation and Environmental Selection in *Gasterosteus aculeatus* L. in the Pacific Northwest, America. 32

HAY, D. A. Recognition by *Drosophila melanogaster* of Individuals from Other Strains or Cultures: Support for the Role of Olfactory Cues in Selective Mating. 171

HEDRICK, PHILIP W. Factors Responsible for a Change in Interspecific Competitive Ability in *Drosophila*. 513

HELMS, MARY W. Prehistoric Agriculture. (review) 311

HUANG, SHIU LAN. (See Kojima, Ken-Ichi.) 313

JOHNSTON, RICHARD F., DAVID M. NILES, AND SIEVERT A. ROHWER. Hermon Bumpus and Natural Selection in the House Sparrow *Passer domesticus*. 20

KERR, WARWICK ESTEVAM AND ZULEICE VIANA DA SILVEIRA. Karyotypic Evolution of Bees and Corresponding Taxonomic Implications. 197

KIANG, Y. T. Pollination Study in a Natural Population of *Mimulus guttatus*. 308

KING, JACK LESTER. Theoretical Aspects of Population Genetics. (review) 485

KLEKOWSKI, EDWARD J., JR. Evidence Against Genetic Self-Incompatibility in the Homosporous Fern *Pteridium aquilinum*. 66

KOJIMA, KEN-ICHI AND SHIU LAN HUANG. Effects of Population Density on the Frequency-dependent Selection in the Esterase-6 Locus of *Drosophila melanogaster*. 313

KOJIMA, KEN-ICHI. (See Voelker, Robert A.) 560

KOREF-SANTIBAÑEZ, SUSI. Courtship Behavior in the Semispecies of the Superspecies *Drosophila paulistorum*. 108

KOREF-SANTIBAÑEZ, SUSI. Courtship Interaction in the Semispecies of *Drosophila paulistorum*. 326

LAKOVAARA, SEPPO, ANSSI SAURA, AND CATHERINE T. FALK. Genetic Distance and Evolutionary Relationships in the *Drosophila obscura* Group. 177

LEDIG, F. THOMAS AND JOHN H. FRYER. A Pocket of Variability in *Pinus rigida*. 259

LEFÉBVRE, CLAUDE. (See Cook, Sheila C. A.) 366

LESTREL, PETE. (See Read, Dwight W.) 669

LEVIN, DONALD A. AND DENIS E. BERUBE. *Phlox* and *Colias*: The Efficiency of a Pollination System. 242

LEVIN, DONALD A. Pollen Exchange as a Function of Species Proximity in *Phlox*. 251

LEVIN, DONALD A. Competition for Pollinator Service: A Stimulus for the Evolution of Autogamy. 668

LEVENE, HOWARD. (See Powell, Jeffrey R.) 553

MAGLIO, VINCENT J. Evolution of Mastication in the Elephantidae. 638

MANLEY, GEOFFREY A. A Review of Some Current Concepts of the Functional Evolution of the Ear in Terrestrial Vertebrates. 608

MASAKI, SINZO. Climatic Adaptation and Photoperiodic Response in the Band-legged Ground Cricket. 587

MCNEILLY, THOMAS. (See Cook, Sheila C. A.) 366

MURRAY, BERTRAM G., JR. (See Gill, Frank B.) 282

NICKERSON, RICHARD P. (See Druger, Marvin.) 322

NILES, DAVID M. (See Johnston, Richard F.) 20

OLIVER, CHARLES G. Genetic and Phenotypic Differentiation and Geographic Distance in Four Species of Lepidoptera. 221

OLSON, EVERETT C. Science and Philosophy in the Soviet Union. (review) 675

ORNDUFF, ROBERT. The Breakdown of Trimorphic Incompatibility in *Oxalis* Section Cormiculatae. 52

OSBORN, J. W. On the Biological Improbability of *Zahnreihen* as Embryological Units. 601

OSBORN, J. W. Dental Morphology and Evolution. (review) 676

PATTON, JAMES L. Patterns of Geographic Variation in Karyotype in the Pocket Gopher, *Thomomys bottae* (Eydoux and Gervais). 574

POWELL, JEFFREY R., HOWARD LEVENE, AND THEODOSIUS DOBZHANSKY. Chromosomal Polymorphism in *Drosophila pseudoobscura* used for Diagnosis of Geographic Origin. 553

POWER, DENNIS M. Numbers of Bird Species on the California Islands. 451

PROCTOR, VERNON W. (See Grant, Michael C.) 267

RAVEN, PETER H. Why are Bird-visited Flowers Predominantly Red? 674

READ, DWIGHT W. AND PETE LESTREL. Phyletic Divergence Dates of Hominoid Primates. 669

RICHMOND, ROLLIN C. Genetic Similarities and Evolutionary Relationships among the Semispecies of *Drosophila paulistorum*. 536

ROHWER, SIEVERT A. (See Johnston, Richard F.) 20

SCHOPF, THOMAS J. M. (See Gooch, James L.) 545

SELANDER, ROBERT K. (See Avise, John C.) 1

SELANDER, ROBERT K. (See Webster, T. Preston.) 523

SHEEN, S. J. Isozymic Evidence Bearing on the Origin of *Nicotiana tabacum* L. 143

SNAYDON, R. W. AND M. S. DAVIES. Rapid Population Differentiation in a Mosaic Environment. II. Morphological Variation in *Anthoxanthum odoratum*. 390

SNOW, RICHARD. (See Abdel-Hameed, Fathi.) 74

SOKAL, ROBERT R. AND KOICHI FUJII. The Effects of Genetic Background on the Ecology of Selection in *Tribolium* Populations. 489

SOLBRIG, OTTO T. Breeding System and Genetic Variation in *Leavenworthia*. 155

TAYLOR, ORLEY R., JR. Random vs. Non-random Mating in the Sulfur Butterflies, *Colias eurytheme* and *Colias philodice* (Lepidoptera: Pieridae). 344

TURNER, CARL R. (See Bryant, Edwin H.) 161

TURNER, JOHN R. G. Selection and Stability in the Complex Polymorphism of *Moraba scurra*. 334

VAUGHN, PETER P. Fossils, A Study in Evolution. (review) 677

VOELKER, ROBERT A. AND KEN-ICHI KOJIMA. Fertility and Fitness of XO Males in *Drosophila*. II. Quantitative Analysis. 560

WEBSTER, T. PRESTON, ROBERT K. SELANDER, AND SUH Y. YANG. Genetic Variability and Similarity in the *Anolis* Lizards of Bimini. 523

WILLIAMS, NORRIS H. AND CALAWAY H. DODSON. Selective Attraction of Male Euglossine Bees to Orchid Floral Fragrances and Its Importance in Long Distance Pollen Flow. 84

WRIGHT, G. M. Fertile Glumes in Primitive Cultivated Wheats. 415

YANG, SUH Y. (See Webster, T. Preston.) 523

YOUNG, DAVID A. The Reproductive Biology of *Rhus integrifolia* and *Rhus ovata* (Anacardiaceae). 406

SUBJECT INDEX TO VOLUME 26

Adaptation, by local populations of butterflies, 221
  by crickets, 587
Bees, attractance to floral fragrances, 84
  karyotypic evolution, 197
  pollination, 84, 373
Behavior, bees and floral fragrances, 84
  courtship in *Drosophila*, 108, 326
  flower color and attractance of birds, 684
  mating discrimination in warblers, 282
  of crickets, 587
  paternal role of male sea lions, 307
  recognition by *Drosophila*, 171
  tool using by feeding animals, 464
Competition, between plant populations, 366
  for pollinators, 678
  interspecific in *Drosophila*, 513
DNA content and phylogeny in plants, 427
Drosophila, interspecific competition, 513
  XO males, 560
  melanogaster, density and frequency-dependent selection, 313; homeostasis in a climatic shift, 116; recognition, 171
  obscura, evolution of group, 177
  paulistorum, courtship behavior, 108, 326; genetic similarities, 536
  pseudoobscura, chromosomal polymorphism, 553; maintenance of polymorphism, 322
Evolution, autogamy, 678
  Drosophila obscura group, 177
  cave fishes, 1
  flower color and attractance, 684
  in *Priochirus*, 203
  mastication in Elephantidae, 638; in Artiodactyla, 659
  molars, 474
  Nemophila menziesii and bees, 373
  synapsid jaw, 622
  terrestrial vertebrate ear, 608
  tooth replacement patterns, 435, 601
  tool use, 464
  Tribolium populations, 357
Fitness and fertility of XO males, 560
Fertile glumes in wheat, 415
Genetic differentiation in butterfly populations, 221
Geographic distribution of Coleoptera on Solomon Islands, 130
Hybridization in warblers, 282
Isolation, reproductive in *Chara*, 267
  behavior in warblers, 282
Life table characteristics of *Aedes aegypti*, 185
Morphology, of elephant jaws, 638; Artiodactyla jaws, 659
  of molars, 474
  floral structure in *Oxalis*, 52
  synapsid jaw, 622
Origin, of *Clarkia gracilis*, 74
  of *Drosophila pseudoobscura*, 553
Patterns of tooth replacement, 435, 601
Phylogeny, *Clarkia*, 74
  Drosophila pseudoobscura, 177
  hominoids, 679
  social bees, 197
Pollination, biology of *Nemophila menziesii*, 373
  in a population of *Mimulus guttatus*, 308
  pollen exchange in *Phlox*, 251
  pollen flora in orchids, 84
  stimulus for autogamy, 678
  systems in *Phlox* and *Coleus*, 242
Polymorphism, chromosomal in *Drosophila*, 322, 553; in grasshoppers, 334
  genetic in deep sea animals, 545; in *Drosophila*, 536
  karyotypic in gophers, 574
  nymphalid butterflies, 96
Polyploidy, in fish, 294; in asters, 681
Reproduction, behavior of male sea lions, 681
  biology of *Rhus*, 406
  breeding systems in *Leavenworthia*, 155
  diploid all-female fish, 294
  floral structure in *Oxalis*, 52
  isolating behavior, 326
  isolating patterns in *Chara*, 267
  mate selection in butterflies, 96
  random vs. non-random mating in *Coleus*, 344
  self-incompatibility in ferns, 66
Selection, density and frequency dependent, 313
  effects of genetic background, 489
  environmental factors in fish, 32
  in larval strains of houseflies, 161
  phenotypic in house sparrows, 20
Variation, chromosomal in pocket gophers, 574
  enzymes in *Nicotina*, 143; *Leavenworthia*, 155
  genetic in cave fishes, 1; stickleback, 32; *Anolis*, 523; deep sea animals, 545
  in island bird species diversity, 451
  morphological in *Anthoxanthum*, 390
Variability in *Pinus*, 259